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Gerald A. Hutchinson

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KNOBBE MARTENS OLSON & BEAR LLP

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FOURTEENTH FLOOR

IRVINE, CA 92614

EXAMINER

TSOY, ELENA

ART UNIT

PAPER NUMBER

1762

NOTIFICATION DATE

DELIVERY MODE

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ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jcartee@kmob.com

eOAPilot@kmob.com

Office Action Summary	Application No.	Applicant(s)	
	10/614,731	HUTCHINSON ET AL.	
	Examiner	Art Unit	
	Elena Tsoy	1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 June 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14, 16-19, 52, 53, 57-63 and 65-95 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14, 16-19, 52, 53, 57-63 and 65-95 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 28, 2007 has been entered.

Response to Amendment

Amendment filed on June 28, 2007 has been entered. Claims 55-56, 64 have been cancelled. Claims 1-14, 16-19, 52, 53, 57-63, and 65-95 are pending in the application.

Claim Objections

1. Claims 10-11 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claims 10 and 11 recite the source being infrared and forced air. However, claim 9, on which claims 10-11 depend, does not recite forced air.
2. Claim 80 is objected to because of the following informalities: a phrase "by advancing and rotating through a **flow coating**" seems to be incorrect. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1-14, 16-19, 58-63, and 65-72 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject

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matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The claim 1 contains subject matter such as “forming on the outer surface of an article a first coherent film comprising about 0.05-0.75 grams of epoxy resin” which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification as originally filed discloses depositing about 0.06 to about 0.20 grams of coating material *per coating layer* on a 24 gram perform (See published application, P131). According to the specification as originally filed, claimed 0.05-0.75 grams is a **total** amount of coating material on coated 24 gram performs (See published application, P131). Thus, the specification as originally filed does not provide a support for claimed limitation.

5. Claims 1-14, 16-19, 58-63, and 65-72 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The claim 1 contains subject matter such as “curing/drying the coated article with an irradiation source for about 5-60 seconds” which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification as originally filed discloses that generally, for IR curing, 24 gram preforms with about 0.05 to about 0.75 grams of coating material the curing time is about 5 to 60 seconds (See published application, P164). Thus, the specification as originally filed does not provide a support for curing/drying with an irradiation source of 0.05 to about 0.75 grams of one layer of coating material on the coated article of *any* size.

6. Claims 52-53, and 57 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 52 recites in lines 4-5 “applying an aqueous solution or dispersion comprising a first thermoplastic epoxy resin **and** an organic or phosphoric acid” and further

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recites "withdrawing the perform from the dip coating ... to form a first coherent film comprising an acid *salt* of the thermoplastic epoxy resin", which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification as originally filed discloses that epoxy resin **solution/dispersions** includes organic acid salts produced by the *reaction* of the epoxy resin with these acids (See published application, P103).

7. Claims 1-14, 16-19, 58-63, and 65-72 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for producing coated 24 gram preforms having 0.05 to about 0.75 total grams of coating material deposited thereon (See published application, P131), does not reasonably provide enablement for 0.05 to about 0.75 total grams of coating material deposited on article of any size. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims. The specification as originally filed discloses that preferred deposition amounts for articles of varying sizes may be scaled according to the increase or decrease in surface area as compared to a 24 gram perform, so that articles other than 24 gram preforms may fall outside of the ranges stated above (See published application, P131).

8. Claims 1-14, 16-19, 58-63, and 65-72 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for curing/drying for 5-60 seconds with an irradiation source of 0.05 to about 0.75 **total** grams of coating material of the coated 24 gram preform (See published application, P164), does not reasonably provide enablement for curing/drying for 5-60 seconds with an irradiation source of 0.05 to about 0.75 grams of one layer of coating material deposited on article of **any** size. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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10. Claims 1-14, 16-19, 58-63, and 65-72 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites “about 0.05 to about 0.75 grams of the first thermoplastic epoxy resin” which renders the claim indefinite because it does not recite the basis of calculation, e.g. per square inch or square cm, etc. Note that the same amount of coating material spread on the surface of 100 mL bottle and on the surface of 2 L bottle would result in bottles of different properties and drying time due to different coating thickness.

11. Claims 52-53, and 57 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 52 recites a phrase (i) “an aqueous solution or dispersion comprising a first thermoplastic epoxy *resin* **and** an organic or phosphoric *acid*”, which renders the claim indefinite because it is not clear how the resin is rendered water-solubility or water-dispersibility without *reacting* with acid. For examining purposes the phrase was interpreted according to the specification as originally filed (See P103) as “an aqueous solution or dispersion comprising a salt of a first thermoplastic epoxy *resin* produced by reacting the epoxy resin with an organic or phosphoric *acid*”.

Claim 52 further recites phrase (ii) “withdrawing the perform from the dip coating ... to form a first coherent film comprising an acid *salt* of the thermoplastic epoxy resin” which contradicts (i) since before dip coating the aqueous solution comprises the resin and acid, and after the dip coating it comprises an acid salt.

Double Patenting

12. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re*

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Goodman, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

13. Claims 1-9, 12, 14, 16-18, 52, 53, 57-60, 62, 63 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 31-38 of U.S. Patent No. 6,676,883 in view of Dworak et al (US 6,350,796).

Patent '883 discloses all limitations of claimed invention except that polyhydroxyaminoethers in the solution/dispersion are in the form of acid salts made by reacting with phosphoric acid, lactic acid, malic acid, citric acid, acetic acid, glycolic acid and/or mixtures thereof.

However, Dworak et al teach that amino epoxy resins that are insoluble or have very low solubility in water, especially those based on bisphenol A, which are commonly used commercially, can be formulated as dispersions or solutions in water by neutralizing some or all of the basic groups of the resins with acids, such as formic acid, acetic acid or lactic acid (See column 1, lines 41-47). The degree of neutralization of said groups (i.e., the fraction of ionic groups) are critical for the extent of dilutability in water (See column 1, lines 47-48).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have produced an aqueous solution of polyhydroxyaminoethers of Patent '883 by at least partially neutralizing the polyhydroxyaminoethers with an organic acid such as lactic acid or citric acid to produce a water-soluble salt, as taught by Dworak et al.

All other limitations such as claimed coating weight, drying time, drying by heating, e.g. with infrared rays (infrared oven), would be obvious to determine through routine experimentation depending on particular use of a final product in the absence of showing of criticality.

It is held that it is not inventive to discover the optimum or workable ranges of result-effective variables by routine experimentation. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). See also In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

As to a second coating, it is a well-known principle to reapply a coating composition to achieve a desired thickness of a final coating depending on intended use of the final coated product.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have reapplied a coating dispersion in Patent '883, according to well-known principle, with the expectation of providing the desired thickness of a final coating.

14. Claims 68-71, 74, 75, and 77 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 31-38 of U.S. Patent No. 6,676,883 in view of Dworak et al, further in view of Mallya et al (US 6489387).

The Patent '883 in view of Dworak et al fails to teach that the phenoxy-type coating of the two-ply laminate is further coated with a lubricant.

Mallya et al teach that coating glass or **plastic** bottles (See column 9, lines 55-56) with a low surface energy coating, such as polyethylene waxes (claimed low molecular polyethylene) and fatty acid salts, reduces scratching during conveying of bottles to filling and labeling stations (See column 9, lines 31-35).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have applied a low surface energy coating, such as polyethylene waxes) and fatty acid salts on the phenoxy-type coating of the two-ply laminate of Patent '883 with the expectation of reducing scratching during conveying of bottles to filling and labeling stations, as taught by Mallya et al.

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claims 1-12, 14, 16-19, 52-53, 57-63, and 65-79 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maruhashi (US 4,393,106) in view of Farha (US 5,472,753), further in view of Noda (US 6,872,802), and further in view of Dworak et al (US 6,350,796).

Maruhashi et al disclose a process for making coated plastic containers such as *preforms* (See column 11, lines 64-65) or *bottles* comprising applying onto the outer surface of the container a coating layer 6 of an *aqueous* latex of a (thermoplastic) polyvinylidene chloride (See column 2, lines 42-57) comprising 20 wt % of glycidyl methacrylate (**claimed first layer of epoxy resin**) (See column 16, lines 17-18) by known coating methods such as dip coating, spray coating, brush coating, roller coating, *cast* coating (See column 10, lines 26-31), *sufficiently drying* the coated bottle-shaped container at 40-160°C for 2 seconds to 60 minutes (See column 11, lines 19-24) using perfect oven (See column 15, lines 62-63), air circulated oven (See column 16, lines 41-42), ultraviolet rays or **radial ray** (See column 11, lines 32-33) so as to sufficiently dry the resin coating (See column 11, lines 19-34); applying to the *sufficiently* dried layer 6, a protecting layer 7 (See Fig. 1; column 4, lines 1-6) of an *aqueous* latex of a film forming resin (See column 10, lines 14-17) without adopting a melt extrusion method (i.e. thermoplastic resin) (**claimed second layer**) (See column 10, lines 44-47) by *known* coating methods such as *dip* coating, *spray* coating, brush coating, roller coating, cast coating (See column 10, lines 60-67), *sufficiently drying* the coated bottle-shaped container at 40-160°C for 2 seconds to 60 minutes (See column 11, lines 25-30) using hot air or ultraviolet rays so as to crosslink the resin coating (See column 11, lines 31-34), then heat treating at 30-150°C for 5 seconds to 7 days after the drying operation, if desired (See column 11, lines 25-30).

As to claimed amount of coating material, Maruhashi et al teach that the thickness of the plastic bottle substrate can be changed in a broad range of from a relatively small thickness for a so-called squeeze vessel or light cup to a relatively large thickness for a rigid vessel (See column 10, lines 3-6). The base amount, that is, the weight per unit inner volume, is appropriately chosen from the range of 0.001 to 5 g/ml according to the intended use of the product bottle (See column 10, lines 6-9). Maruhashi et al teach that the thickness of the coating layer 6 may vary within a range of 0.5 to 40 microns to provide satisfactory oxygen barrier property and water vapor

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barrier property (See column 11, lines 45-58), and the thickness of the protecting layer 7 may vary within a range of 0.5 to 1000 microns, preferably 3 to 700 microns (See column 9, lines 44-46) depending on particular use of a final product. It should be noted that the amount of coating material would be proportional to the thickness of coating layer.

It is held that it is not inventive to discover the optimum or workable ranges of result-effective variables by routine experimentation. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). See also In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have determined the optimum values of the relevant thickness/amount of each coating layer parameters (including those of claimed invention) in Maruhashi et al through routine experimentation depending on particular use of a final product in the absence of showing of criticality.

As to claimed curing/drying time, Maruhashi teaches that the conditions adopted for drying the coated copolymer layer are changed according to the *thickness* of the coating layer, but ordinarily, a sufficient drying effect can be attained when drying is carried out at a temperature of 40⁰C to 160⁰C for about 2 seconds to about 60 minutes (See column 11, lines 19-24).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have determined the optimum values of the relevant time period parameters (including those of claimed invention) in Maruhashi et al through routine experimentation depending on particular amount of the coating material in the absence of showing of criticality.

As to claims 3, 65-67, 70, 72, any of synthetic resins including *thermoplastic* synthetic resins (See column 8, lines 47-48), other than polyvinylidene chloride resins, such as polyolefins e.g. low molecular weight polyethylene (See column 8, lines 61-66), *polyesters* (See column 8, line 68 to column 9, lines 1-2), e.g. *polyethylene terephthalate* (See column 8, line 68), *acrylics* (See column 9, lines 10-14), *epoxy* resin (See column 9, lines 26-32, 39-43), which is different from a glycidyl methacrylate component of a first coating layer 6. Maruhashi teaches that the **protecting** layer may be formed by **melt molding** instead of coating with the *aqueous* latex or organic solvent solution (See column 12, lines 12-14), i.e. the protecting layer 7 may be of thermoplastic epoxy resin. Maruhashi teaches that this multi-layer structure provides the plastic

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container with an excellent in the barrier property to gases such as nitrogen, carbon dioxide gas, oxygen and steam, and moisture (See column 1, lines 6-18).

As to claim 4, *crosslinking* agents may be added to at least one of the vinylidene chloride copolymer or film-forming resin according to known recipes (See column 12, lines 46-49). Clearly, drying the first layer 6 having *crosslinking* agents at elevated temperature would result in crosslinked layer. It is the Examiner's position that the crosslinked layer would have chemical or mechanical abuse resistance inherently.

As to claims 5-6, a resin that is preferably used for formation of a bottle substrate, include *polyolefins* (See column 7, line 66 to column 8, line 23), e.g. *polypropylene* (See column 8, lines 62-63), *polyesters* such as polyethylene terephthalate (See column 8, lines 23-24), *polyamides* (See column 8, lines 25-26), and *polycarbonate* (See column 8, lines 33-34).

As to claim 8, since the container of Maruhashi et al is evenly coated as shown in the Fig. 1, it is the Examiner's position that the coated article is withdrawn from the dip, spray, or cast coating at a rate so as to remove excess of a coating material and form a first coherent film inherently. If this position could be argued, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have withdrawn the container from the dip, spray, or cast coating in Maruhashi at such a rate so that to remove excess of a coating material and form the desired coherent film.

As to claims 9-10, Maruhashi et al teach that hot air drying, ultraviolet rays or radial ray may be used for curing coated layer (See column 11, lines 31-34). It is the Examiner's position that it is well known in the art to use infrared ray for heat curing a coating layer. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used infrared as radial ray in Maruhashi et al with the expectation of providing the desired heat curing of the coated article because it is well known in the art to use infrared ray for heat curing, and because Maruhashi et al do not limit their teaching to particular radial rays.

As to claim 14, the coatings have gas barrier properties (See column 2, lines 57-68) and UV-protected (See column 12, lines 44-45). It is the Examiner's position that the article would exhibit substantially no blushing or whitening when exposed to water because it is made by a process substantially identical to that of claimed invention.

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As to claims 60-61, Maruhashi et al teach that the coating operation may be conducted only once or a **multiple stage** coating method may be applied (See column 10, lines 31-33).

Thus, Maruhashi et al teach that more than two coatings may be applied.

Also, it is a well-known principle to reapply a coating composition to achieve a desired thickness of a final coating depending on intended use of the final coated product.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have reapplied a coating dispersion in Maruhashi, according to well-known principle, with the expectation of providing the desired thickness of a final coating.

As to claims 68-71, Maruhashi teaches that in forming the coating layer or protecting layer, known additives may be incorporated into coating and/or protecting layers (See column 12, lines 29-31) such as *lubricant* (See column 12, lines 46-47).

Since Maruhashi does not limit lubricants, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added any conventional lubricant including claimed lubricants to a protecting layer of Maruhashi with the expectation of providing the desired sliding characteristics.

Thus, Maruhashi discloses applying onto the outer surface of *preforms* or *bottles* of e.g. PET (See column 8, lines 23-24) an *aqueous latex* (See column 10, lines 10-18) of a (thermoplastic) polyvinylidene chloride (See column 2, lines 42-57) comprising 20 wt % of glycidyl methacrylate (claimed first layer of epoxy resin) (See column 16, lines 17-18). Maruhashi et al teach that the thickness of the coating layer 6 may vary within a range of 0.5 to 40 microns to provide satisfactory oxygen barrier property and water vapor barrier property (See column 11, lines 56-58),

Maruhashi fails to teach that polyhydroxyaminoether copolymers made from resorcinol diglycidyl ether, hydroquinone diglycidyl ether, bisphenol A diglycidyl ether, or mixtures thereof may be used instead of polyvinylidene chloride/glycidyl methacrylate for forming the coating layer 6.

Farha teaches that "phenoxy-type" thermoplastics such as poly(hydroxy amino ethers) of formula I (See columns 3, 4), which are known to possess good oxygen barrier properties combined with excellent mechanical properties (See column 2, lines 39-51), may be used to

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provide gas barrier properties by forming *either three-ply* laminates with thermoplastic polyesters in general or PET bottles in particular (See column 2, lines 51-55; column 3, lines 37-39). The laminates are made by **extrusion or coextrusion** (See column 11, lines 43-45) of molten resins (See column 11, lines 57-60).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used poly(hydroxy amino ether (PHA) for forming a coating layer 6 in Maruhashi et al instead of polyvinylidene chloride/glycidyl methacrylate copolymer with the expectation of providing the desired good oxygen barrier properties combined with excellent mechanical properties, as taught by Farha, depending on particular use of a final product.

Maruhashi et al teach that the polyvinylidene chloride/glycidyl methacrylate copolymer is ordinarily difficult to mold by heating and melting, and therefore, the copolymer is used for coating a plastic bottle substrate in the form of an aqueous emulsion or latex (See column 6, lines 23-29). Maruhashi et al teach that the protecting layer (of e.g. epoxy resin) may be formed by **melt molding** instead of coating with the aqueous latex or organic solvent solution (See column 12, lines 12-14). In other words, Maruhashi et al teach that **if a resin can be melted**, it can be applied by melting or in the form of an aqueous latex or an organic solvent solution.

Maruhashi et al in view of Farha fail to teach that PHA is applied as *an aqueous dispersion or solution*.

Noda teaches that a polymer coating may be applied as a solutions in an organic solvent, as aqueous solution or emulsion, as a hot melt (solid molten or softened by heat); extrusion coating is similar to hot-melt coating (See column 18, lines 37-43).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have applied a PHA coating layer in Maruhashi et al in view of Farha in the form of an aqueous dispersion or solution instead of a hot melt or an aqueous emulsion since Noda teaches that a polymer coating may be applied as a solutions in an organic solvent, as aqueous solution or emulsion, as a hot melt.

Maruhashi et al in view of Farha in view of Noda fail to teach that a dispersion or solution of the thermoplastic epoxy resin comprises organic acid salts made from the reaction of polyhydroxyaminoethers with phosphoric acid, lactic acid, malic acid, citric acid, acetic acid, glycolic acid or mixtures thereof.

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Dworak et al teach that amino epoxy resins that are insoluble or have very low solubility in water, especially those based on bisphenol A, which are commonly used commercially, can be formulated as dispersions or solutions in water by neutralizing some or all of the basic groups of the resins with acids, such as formic acid, acetic acid or lactic acid (See column 1, lines 41-47). The degree of neutralization of said groups (i.e., the fraction of ionic groups) are critical for the extent of dilutability in water (See column 1, lines 47-48).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have produced an aqueous solution of polyhydroxyaminoethers of Maruhashi et al in view of Farha in view of Noda by at least partially neutralizing the polyhydroxyaminoethers with an organic acid such as lactic acid or citric acid to produce a water-soluble salt, as taught by Dworak et al.

17. Claims 8, 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maruhashi et al in view of Farha, further in view of Noda, further in view of Dworak et al, and further in view of Cobbs, Jr et al (US 4,573,429).

The cited prior art is applied here for the same reasons as above. The cited prior art fails to teach that the process further comprises the removal of any excess material between the coating and curing/drying steps (Claim 8), the article is *rotated* to achieve consistent coating and curing/drying (Claim 13).

Cobbs, Jr et al teach that a container can be coated by spraying a coating material (See Fig. 1) by rotating the container in front of one or more airless spray nozzles to achieve complete coating of the outside surface to be coated (See column 6, lines 33-43; column 9, lines 10-14) and thereby removing any excess material. The coating was dried to a tack-free or dry to the touch state by radiant heating by continuing rotation of the bottle over a hot plate (See column 12, lines 14-22).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have coated a container of the cited prior art by spraying the container while rotating and drying the container while rotating with the expectation of providing the desired complete uniform coating of the outside surface to be coated, as taught by Cobbs, Jr et al.

18. Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maruhashi et al in view of Farha, further in view of Noda, further in view of Dworak et al, and further in view of Miyake et al (US 5079034).

The cited prior art is applied here for the same reasons as above. The cited prior art fails to teach that IR is used for drying/curing.

Miyake et al teach that any drying method such as hot air, microwaves, infrared rays, and ultraviolet rays (See column 7, lines 5-7) may be used for heat drying an aqueous polymerizable solution (See column 6, lines 61-65) at a temperature within 50-150°C (See column 6, lines 27-35).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used IR rays as radial rays in the cited prior art with the expectation of providing the desired heat curing of the coated article because Miyake et al teach that any drying method such as hot air, microwaves, infrared rays, and ultraviolet rays may be used for heat drying an aqueous polymerizable solution, and because Maruhashi et al do not limit their teaching to particular radial rays.

19. Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maruhashi et al in view of Farha, further in view of Noda, further in view of Dworak et al, and further in view of Kennedy (US 4,505,951).

The cited prior art is applied here for the same reasons as above. The cited prior art fails to teach that the coatings are dried using infrared heating (Claim 9 and 12) together with a forced air (Claim 10) at a temperature of 10-50°C to prevent shrinkage (Claim 11).

Kennedy teaches drying a water-based latex of polyvinylidene chloride coating on the outer surface of PET container or preform applied by known means such as spraying, dipping, flow coating or roller coating (See column 2, lines 59-61) by simultaneously heating the latex on the container or preform with infra-red light energy and blowing cooling air (claimed forced air) at a temperature of about 40°F to 60°F (See column 3, lines 6-24; column 4, lines 1-13) allows preventing undesirable shrinkage of the container while maximizing the removal of liquids without prematurely sealing the surface which would entrap unexpelled liquid (See column 1, lines 35-39).

As to claims 9 and 12, It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used infrared energy to heat coatings in the cited prior art with the expectation of providing the desired sufficiently dried coatings since Kennedy teaches that infrared energy can be used for heat-drying the coatings.

As to claims 10-11, It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used infra-red light energy and blowing cooling air in the cited prior art at a temperature of about 40⁰F to 60⁰F with the expectation of preventing undesirable shrinkage of the container while maximizing the removal of liquids without prematurely sealing the surface which would entrap unexpelled liquid, as taught by Kennedy.

20. Claims 80-88, 90-95 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maruhashi et al in view of Farha, further in view of Noda, further in view of Dworak et al, further in view of Kennedy, and further in view of Cobbs, Jr et al.

The cited prior art is applied here for the same reasons as above. The cited prior art fails to teach that: (i) articles are coated by *flow* coating; (ii) a plurality of articles are coated by advancing and *rotating* through a flow coating..

As to (i), Kennedy teaches that a water-based latex of polyvinylidene chloride coating can be applied on the outer surface of a container or preform by *known* means such as spraying, dipping, **flow** coating or roller coating (See column 2, lines 59-61).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a flow coater for aqueous based coatings in Maruhashi et al since Kennedy teaches that a water-based latex of polyvinylidene chloride coating can be applied on the outer surface of a container or preform by *known* means such as spraying, dipping, **flow** coating or roller coating; (iii) an intermediate coating is applied between first and second coatings

As to (ii), Cobbs, Jr et al teach that *rotating* a container in front of one or more airless spray nozzles (See Fig. 1) allows to achieve complete coating of the outside surface to be coated (See column 6, lines 33-43; column 9, lines 10-14).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have coated a container of the cited prior art by spraying the container while

rotating with the expectation of providing the desired complete uniform coating of the outside surface to be coated, as taught by Cobbs, Jr et al.

Obviously, rotating while coating would achieve uniform coating with flow coating technique.

As to coating a plurality of articles by advancing and rotating while flow coating, it is the Examiner's position that it would be within the level of ordinary skill to coat simultaneously a plurality of articles by advancing and rotating while flow coating.

As to (iii), (A) Farha teaches that an amorphous copolyester, disposed as an intermediate layer between the phenoxy-type thermoplastic layer and the PET layer in the three-ply laminate embodiment, is compatible with and thus adheres to both of these plies (See column 9, lines 59-65). The two layers that constitute the two-ply embodiment adhere to each other primarily because of the compatibility and, therefore, because of the bond formed between the copolyester constituent of the outer layer and the PET substrate layer (See column 9, lines 65-67; column 10, lines 1-3).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have positioned an intermediate layer of an amorphous copolyester between the phenoxy-type thermoplastic layer and the PET layer in the cited prior art with the expectation of providing the desired improved adherence, as taught by Farha.

(B) Maruhashi et al teach that the coating operation may be conducted only once or a **multiple stage** coating method may be applied (See column 10, lines 31-33). Thus, Maruhashi et al teach that more than two coatings may be applied.

Also it is a well-known principle to reapply a coating composition to achieve a desired thickness of a final coating depending on intended use of the final coated product.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have reapplied a coating dispersion in the cited prior art according to well-known principle, with the expectation of providing the desired thickness of a final coating.

21. Claim 89 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maruhashi et al in view of Farha, further in view of Noda, further in view of Dworak et al, further in view of Kennedy, further in view of Cobbs, Jr et al, and further in view of Fagerburg et al (US 4499262).

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The cited prior art is applied here for the same reasons as above. The cited prior art fails to teach that polyester of the second coating is sulfonated polyester.

Fagerburg et al teach that sulfo-modified PET have improved properties compared to PET such as improved planar stretch ratios, improved acetaldehyde generation (See column 1, lines 15-53) and may be cast into a variety of shaped articles, including for example, films, sheets and containers (See column 1, lines 57-60). It is well known in the art that sulfo-modified polymers are water-soluble or water dispersible.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used sulfo-modified PET for forming a protecting coating in the cited prior art instead of PET with the expectation of providing the desired improved properties compared to PET, as taught by Fagerburg et al.

Response to Arguments

24. Applicants' arguments filed June 28, 2007 have been fully considered but they are not persuasive.

Response to Rejections Based on 35 U.S.C. § 103(a)

Claim 1

Applicants submit that amended Claim 1 includes limitations not disclosed or suggested by the combination of any of the cited references. For example, all of Maruhashi, Farha, and Noda (the primary references) fail to disclose or suggest "applying an aqueous solution or dispersion of a first thermoplastic epoxy resin on the outer surface of an article substrate by dip, spray, or flow coating, the aqueous solution of the first thermoplastic epoxy resin prepared by agitating a thermoplastic epoxy polymer in a solution of water with an organic acid or phosphoric acid" as recited by amended Claim 1.

The Examiner respectfully disagrees with this argument. Amended Claim 1 recites aqueous dispersion **or** solution of epoxy resin. Therefore, *the solution* prepared by reacting the resin with acid, is **optional** in claim 1. As was discussed above, in contrast to Applicants argument, Maruhashi does teach an aqueous dispersion of epoxy resin.

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Claim 52

Applicants submit that amended Claim 52 includes limitations not disclosed or suggested by the combination of any of the cited references. For example, all of Maruhashi, Farha, and Noda fail to disclose or suggest "applying an aqueous solution or dispersion comprising a first thermoplastic epoxy resin and an organic or phosphoric acid" as recited by amended Claim 1.

The Examiner respectfully disagrees with this argument for the reasons discussed above. Claim 52 incorporates limitations of dependent claim 18 which were rejected by the Examiner in the previous Office Action. Besides, techniques of rendering resins water-soluble, including Applicants' technique with making salts, are **well known** and *routinely* used in the art, for example, for converting solvent based resin compositions into aqueous compositions because of environmental considerations.

Claim 80

Applicants submit that amended Claim 80 includes limitations not disclosed or suggested by the combination of any of the cited references. For example, all of Maruhashi, Farha, and Noda (the primary references) fail to disclose or suggest "curing/drying the plurality of coated articles with an irradiation source for about 5 to 60 seconds to form a first coating layer on each article, the first coating layer comprising an acid salt of the first thermoplastic epoxy resin" as recited by amended Claim 80.

The Examiner respectfully disagrees with this argument for the reasons discussed above in paragraph 15.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elena Tsoy whose telephone number is 571-272-1429. The examiner can normally be reached on Monday-Thursday, 9:00AM - 5:30 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Elena Tsoy
Primary Examiner
Art Unit 1762

ELENA TSOY
PRIMARY EXAMINER
ETsoy

July 31, 2007